SUMMARY REPORT

Promote rice planted area and production estimation using space-based technologies in Cambodia

20th - 21st February 2024

Department of Planning and Statistics (DPS)

Ministry of Agricultural Forestry and Fisheries (MAFF), Cambodia

INTRODUCTION

Cambodia is one of the world's largest rice producers. The strong focus on rice production is related to the need to ensure food security and alleviate poverty in the country. The development and modernization of the rice sector are also reflected as the main priorities of the government's growth and poverty reduction strategy. Many policies, plans and development frameworks have been established to drive the growth of the rice sector, such as the National Strategic Development Plan, the Rectangular Strategy, the Agriculture Sector Strategic Development Plan, the Rice Policy and the Rice Export Policy. However, there were several challenges faced by the responsible departments and organizations in collecting, analyzing, validating and disseminating evidence and information on rice spatial distribution and production, which often caused delays in the decision-making process. The use of space-based technologies for estimating rice planted area and production plus the good practice from this promotion can significantly contribute to timely and accurate production assessment, planning and decision-making. It is beneficial to modernize the conventional approaches and practices, promote transparency and responsibility, and effectively support the implementation of various development plans, policies and strategies in particular the development of the rice sector. With the recent development of remote sensing and the emerging innovative applications in agriculture, there have been successful stories of adopting space-based technologies for crops and food production estimation at regional, national and local levels worldwide.

BACKGROUND

The “Promote rice planted area estimation using space-based technologies” under the Asia Pacific Regional Space Forum (APRSAF) Space Applications for Environment (SAFE) initiative, the rice crop monitoring project (hereafter called “INAHOR activity”) was approved as an APRSAF SAFE initiative in 2016, and since then this project has been conducted as "SAFE project".

Since the rice planted area estimation using INAHOR requires the development of training data in the target countries, JAXA started to work with the ASEAN Food Security Information System (AFSIS) Function for Emergency," hereafter called the "SAFER project" to develop training data for AFSIS member countries.

These projects (SAFE and SAFER) collaborated with the Department of Planning and Statistics (DPS), MAFF, Cambodia, to develop and validate training data using optical satellites for dry-season rice in 2023–2024.

The project workshop has been held in Phnom Penh on February 20th 2024, with all relevant parties invited, and a field survey has been conducted on the 21st in Prey Veng province.

OBJECTIVES

1. The workshop is to share knowledge and information on how space-based technologies can be utilized in promoting rice planting and production estimation
2. The lecturers will provide guidance and share their knowledges to participants on utilizing such technology for their works as well as discuss on the different data between official data and estimated data from INAHOR system.
3. To validate the actual selected rice fields conditions with rice planted area map obtained from the INAHOR system.

PARTICIPANTS IN THE WORKSHOP

The workshop was held on February 20, 2024 at Himawari Hotel, Phnom Penh. The workshop was chaired by HE Srey Vuthy, Secretary General of the Ministry of Agriculture, Forestry and Fisheries, as well as related departments such as the Department of Planning and Statistics (7 people), the General Department of Agriculture (2 people), the Information and Documents Center (2 people), JAXA (2 people) AFSIS (3 people) MAFF's JAPAN (2 people) Provincial Department of Agriculture, Forestry and Fisheries (PDAFF) of Kampong Chhnang (4 people 1 people female), PDAFF of Prey Veng (5 people). Total of the participants approximately 28 participants (22 male, 6 female). The ratio of male and female is 11 : 3.

OPENING SESSION

HE. Srey Vuthy, Secretary General of the Ministry of Agriculture, Forestry and Fisheries, has delivered a welcomed remarks to all delegates and participant to the Workshop. His Excellency informed the workshop that the Minister of Agriculture, Forestry and Fisheries, along with the presiding committee, held a Consultative Workshop on Data Collection and Analysis of Agricultural Statistics Data on the use of INAHOR technology base ALOS-2 data. The workshop aimed to verify satellite data and administrative statistics obtained from provinces and districts of Kampong Chhnang and Prey Veng by examining changes from year to year. The comparison of data from INAHOR with statistical data was conducted to verify any acceptable level of bias. The Department of Planning and Statistics cooperated with the Japanese side to verify data between the map and the actual field on dry season rice crop, achieving an exact level of about 95%. The workshop emphasized the importance of research and development of new technologies in verifying cultivation data and monitoring arable land development for strategic planning. The workshop aimed to be effective, efficient, and successful.

Dr. Kei Oyoshi, Senior Researcher, Earth Observation Research Center, JAXA, made a statement expressing his sincere gratitude to the Ministry of Agriculture, Forestry and Fisheries, especially the Department of Planning and Statistics, for working closely with AFSIS to organize this important workshop. He believes that INAHOR with ALOS-2 will contribute to improving the reliability of rice statistics generated by reporting systems by providing scientific information for participants.

In The workshop opens with a remark by Dr. Sumanya Ngandee, AFSIS Manager, on rice planted area estimation using space-based technology in Cambodia, highlighting the importance of accurate and efficient data collection and reporting for food security. The workshop is part of the SAFER project "Crop area estimation" and aims to optimize INAHOR utilization in Cambodia's agricultural sector. The speaker expresses gratitude to the Department of Planning and Statistics, the Ministry of Agriculture and Fisheries of Cambodia, and JAXA for their support and collaboration. The workshop aims to develop delegates' capacity in rice planted area estimation and contribute to enhancing food security and well-being in the region.

Mr. Hosaka Masahiro, Deputy Director, Statistics Planning Division, MAFF Japan, contributed to improving agricultural statistics in Cambodia through several initiatives, such as a series of AFSIS activities and JICA training courses. Japan always welcomes new support ideas to improve agricultural statistics in Cambodia. From the viewpoint of the producer of official agricultural statistics, satellite information can be a promising tool to collect reliable data efficiently. Such data is crucial for further developing the agricultural industry and improving life in rural areas. The department is also supporting ASEAN states in enhancing their satellite-based agricultural statistics production capacity through the Japan-funded AFSIS project. One of the project's activities is introducing JAXA's expertise regarding the ASEAN region's rice planted area estimation method. MAFF, Japan, is confident that the project will be concluded with fruitful results, considering the efforts of relevant parties and its ongoing progress. They recognize that continuous support is necessary to fully utilize this advanced tool's potential and are very interested in hearing the results of the activities in Cambodia.

CONTENT OF THE WORKSHOP RESULTS

Mr. Miyake Yasuhiro, an AFSIS expert, provided a workshop on the overview and expected results under the SAFER project, focusing on crop area estimation methods using satellite imagery. Through this workshop, he also presented the objectives of capacity building for officials and knowledge sharing on the INAHOR system Operational Guidelines expected to be implemented in the target countries. On the other hand, the operation of INAHOR must ensure the sustainable implementation of this technology to enhance the development of food security information in accordance with the specific needs of the country. Establishment of mechanisms for quality assurance, monitoring and continuous improvement of the INAHOR system.

Dr. Kei Oyoshi, Senior Researcher from JAXA, gave an overview of APRSAF / SAFE and INAHOR projects that can identify rice fields using ALOS-2 satellite data with AI (Artificial Intelligence) technology created. The use of INAHOR with ALOS-2 and Sentinel-2 satellites especially during the dry season is expected to increase the reliability of rice statistics in reporting systems by providing objective information generated through scientific methods. For Cambodia, the project started in 2017 under the APRSAF/SAFE prototyping project, starting with the INAHOR Guidance, field visit, demonstration and discussion of data validation procedures between INAHOR and official statistics.

Mr. Men Sothy, the Chief Agricultural Statistics Office, Department of Planning and Statistics, Ministry of Agriculture, Forestry and Fisheries, presented his experience from the 2nd Regional Workshop on the ASEAN Food Security Information System (AFSIS) Function for Emergency (SAFER) project. On December 12 and 13, 2023 in Bangkok, Thailand. The presentation covered the use of INAHOR system and ALOS-2 satellite imagery in stages such as setting up Gmail and Google Earth Engine (GEE) accounts for a preliminary preparation. They were also instructed on the installation of essential software, namely "Quantum GIS (QGIS)" and "Google Earth Pro" as these tools are crucial for creating training data and estimating rice crop areas.

Mr. Shoji Kimura, the coordinator of SAFE project made a presentation on the validation of 2023-24 dry season rice cultivation area using INAHOR in Cambodia. Underlined, this validation and discussion are to examine the factors affecting to the difference between the reported value and the INAHOR estimated value, and is not intended to determine which value is correct. The discussion focused on two provinces: Kampong Chhnang, focus on 3 districts, and Prey Veng, focus on 4 districts. In Kampong Chhnang province, some communes have reported value and INAHOR estimates value these anomalies may be due to reports not including restricted areas or some double cultivation areas.

Dry season rice cultivation in Prey Veng province: INAHOR judges that dry season rice is mixed with other crops in Svay Antor district. For this reason, it is difficult to estimate the value by INAHOR accurately, on the other hand, the reported value also seems to be too high. It is necessary

to consider the area under dry season rice cultivation with in mind, while also considering the area under other important crops.

Mr. Kimura Shoji presented about INAHOR utilization by new validation framework is that we can check the estimated results by INAHOR on the map. Moreover, he emphasized the importance of data and factors to consider for high accuracy as well as the characteristics of INAHOR to improve the convenience of this function, as well as “validation sheet” creation function also. District officers as well as province officer will be able to validate the reported values while checking the cultivated area and distribution of cultivated field in the total area of each administrative region by using INAHOR's functions. In the future, he expected that DPS staff will serve as training instructors and provide INAHOR operation training to local officials.

Mr. Kimura Shoji also highlights those basic statistics are the most important statistics for users to look at increasing reliable cultivated area, high-yield, and large production. In addition to food consumption, we can also export and decrease imports.

Following the workshop, field survey/visited has been conducted, the working group also visited the field in Prey Veng province, Svay Antor district with the participation of provincial officials. There are 5 points to be inspected in Svay Antor district: Svay Antor commune, such as Ang Tret, Pean Rong, Samrong and Teuk Thla commune. Out of these 5 points, the working group visited 3 points (Svay Antor commune, Ang Tret commune and Samrong commune) and found that all the designated locations were cultivating dry rice crops using stored water and groundwater. For this year, the climate change, the Royal Government as well as the Ministry of Water Resources and Meteorology have issued a press release on the economical use of water, causing farmers to lack water for cultivation in the second phase of dry season rice.

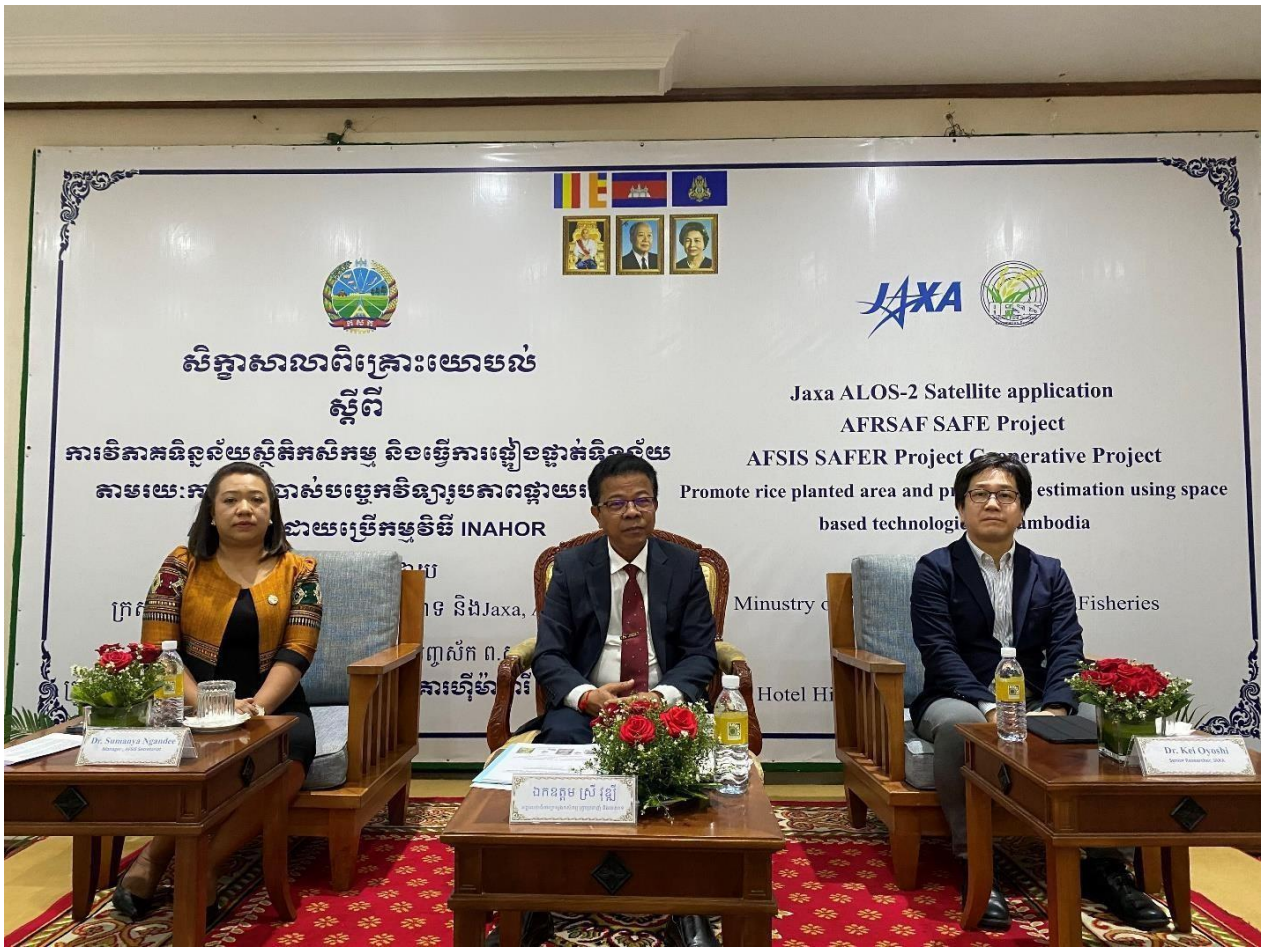
CLOSING SESSION

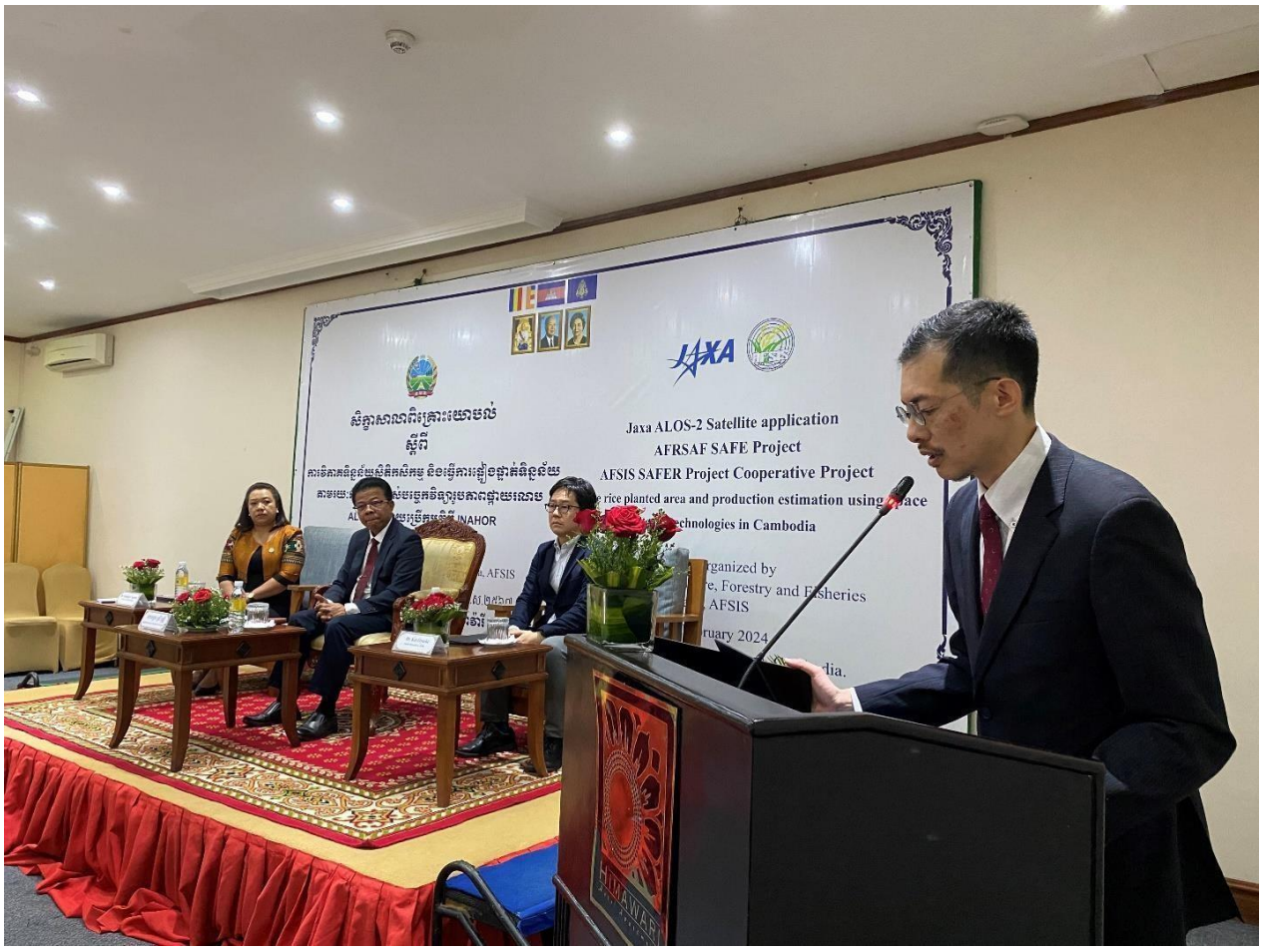
Mr. Mak Mony, Director of DPS, MAFF of Cambodia, acknowledged their contributions and emphasized the importance of collaboration and positive change. He also thanked the MAFF, Japan, for their support and recognized the expertise of Japanese experts and representatives from JAXA in the utilization of the satellite agro- meteorological system for crop monitoring activities and using INAHOR function. Additionally, he expressed appreciation to the AFSIS Secretariat for fruitful workshop collaboration and looks forward to future collaboration on the SAFER Project.

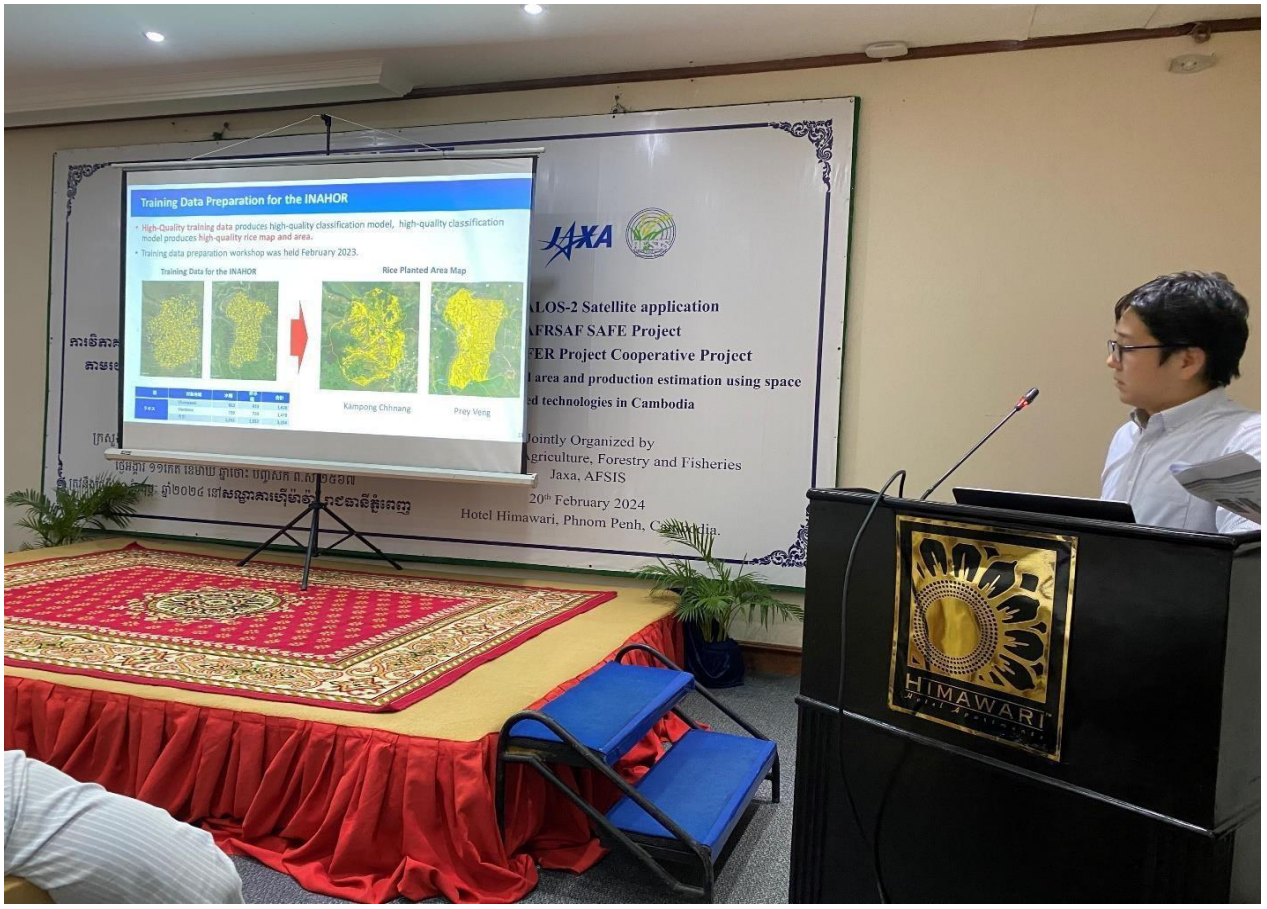
CONCLUSION

The workshop was successfully completed with the participants paying attention, discussing and providing input and gaining valuable insights and skills in operating the INAHOR system as well as verifying the data for accuracy. Participants sincerely thanked the expert for explaining the instructions to them throughout the workshop. Their understanding and attention contributed significantly to the atmosphere of discussion and the success of the entire workshop.

1- Workshop activities




JAXA
Jaxa ALOS-2 Satellite application
AFRSAF SAFE Project
AFSIS SAFER Project Cooperative Project
HIMAWARI


Training Data Preparation for the INAHOR
High-Quality training data produces high-quality classification model, high-quality classification model produces high-quality rice map and area.
Training data preparation workshop was held February 2023.
Training Data for the INAHOR
Rice Planted Area Map
Kampong Chhnang
Prey Veng
JAXA
HIMAWARI

2- Field Visited